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ACHIEVE HIGH SPEEDS WITH CERAMIC CUTTERS; URGE WIDER DISSEMINATION OF ELECTRICAL PROCESSING METHODS IN USSR

NEW THERMOCORUNDUM BLADES REPLACE HARD ALLOY -- Leningradskaya Pravda, 9 Oct 51

All types of Soviet hard alloys are a great deal more durable than foreign types, including those of the US. Soviet high-speed machine tools permit a cutting speed three times as fast as machine tools of the well-known US firm, Giddings /Giddings and Lewis Machine Tool Company, Fond du Lac, Wisconsin/.

It must be borne in mind, however, that hard alloys are expensive and scarce materials. The cost of blades for one cutting tool is 5 or 6 rubles. This circumstance frequently hampers more extensive introduction of high-speed methods.

For this reason, the work being done at the Leningrad All-Union Scientific Research Institute of Abrasives and Grinding merits special attention. In 1950, S. G. Voronov, senior scientific associate of the institute and Stalin Prize winner, and a group of workers at the institute developed a new tool material called thermocorundum. This is a white ceramic substance resembling porcelain but possessing unusual hardness. Experiments conducted by Voronov have shown that thermocorundum can replace diamond and can be used in the manufacture of press molds and various types of measuring tools. Voronov resolved to find a way to use ceramic thermocorundum blades in cutting metal.

Workers at the Leningrad Machine Tool Building Plant imeni Il'ich have become interested in this venture. The institute has pledged to supply the plant with most durable ceramic blades for cutting tools. The plant personnel have begun searching for practical applications for the new material.

In the beginning, many difficulties were encountered. In particular, it was hard to develop suitable solder for fastening the ceramic blades to the metal tool shanks. Later, a great deal of effort was put forth in working out a method of grinding and regrinding the thermocorundum.

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A few months ago, the first cutter with ceramic blades was handed to N. N. Vasil'yanov, one of the best lathe operators at the plant. With the use of this cutter, he turned a piece of pig iron at the rate of 500 meters per minute. The average speed achieved with the use of hard-alloy cutters in machining this material was 120 meters per minute.

High productivity was also achieved with the use of these cutters in machining bronze parts; and two Stakhanovites have successfully begun using them for machining steel.

Workers at the institute have organized the manufacture of thermocorundum blades for all types of cutters such as boring, facing, etc. Supply rooms of all shops are being stocked with the new cutters.

The thermocorundum blades cost only one fifth as much as hard alloy, and are three or four times as durable in machining iron and bronze; they also give steel parts a better finish.

Learning about the new thermocorundum cutters at the Plant imeni Il'ich, G. S. Bortkevich, a renowned high-speed worker, shared his experiences with lathe operators at the Riga VEF Plant. Although he achieved the fantastic speed of 1,400 meters per minute in machining iron, a few days after he left these cutters with his Latvian friends, they set a new record of 1,700 meters!

The plant and institute are now working on instructions for the use of thermocorundum cutters. With this, however, the task of extensive adoption of the new material will still not be complete. Research must be continued. The thermocorundum does not yet have adequate durability under impact. It must be tested for milling and large boring operations as well as for other types of metalworking.

The experimental plant of the institute is now producing the new cutters by the thousands. They are manufactured from readily available material. With the expansion of production bases, thermocorundum blades for cutters will cost even less than at present.

In the past, machine tool builders said that a cutting tool did not exist which could utilize the capacity of modern Soviet machine tools to the utmost. Such a tool has now been created. Without doubt, the capacity of many machine tools will be lower then the potentials of the tool. The invention of a tool material which is more durable than hard alloy, is presenting designers and machine tool builders with new problems. More powerful machine tools will have to be developed.

It must be noted that the use of ceramic materials in cold metalworking is not known to exist in any other country. -- A. Maksimets, director, Machine Tool Building Plant imeni Il'ich

CLAIM DEVELOPMENT OF CERAMIC CUTTING TOOL -- Kiev, Pravda Ukrainy, 28 Oct 51

Associates of the Central Scientific Research Institute of Technology and Machine Building have developed a new tool, the ceramic cutter.

The ceramic cutters can remove rough spots from cast iron at a speed exceeding 1,700 meters per minute, and of steel parts, at a speed of 1,200 meters. The ceramic tool does not contain single gram of expensive metal.

USE THERMOCORUNDUM CUTTING TOOLS -- Leningradskaya Pravda, 8 Dec 51

Since July 1951, experiments on the application of ceramic blades on cutters have been conducted at the Leningrad Machine Tool Building Plant imeni Sverdlov. Cutters with thermocorundum blades have found especially wide use in the manufacture of cast iron and bronze parts.

CERAMIC CUTTERS NEED FURTHER DEVELOPMENT -- Moscow, Izvestiya, 18 Dec 51

At present, work is being done on the replacement of hard alloys with a cheaper material which considerably excels known alloys. Tools with ceramic substitutes make it possible to manufacture parts with an ideal surface finish. With mass introduction of the new substitute, the national economy will realize a big saving is expensive and scarce elements. Experimental models of ceramic blades as yet lack uniformity in hardness and porosity; in plant practice, there have been many instances where the cutting edges have chipped.

TEST AUTOMATIC LINE FOR PRODUCTION OF HARD ABRASIVE WHEELS -- Moscow, Vechernyaya Moskva, 4 Oct 51

Testing of an automatic line for the production of abrasive wheels 300 millimeters in diameter has been completed at the experimental plant of the All-Union Scientific Research Institute of Abrasives and Grinding.

The automatic line is 32 meters long. It consists of three sections: preparatory, pressing, and heat treatment. These are connected by a single belt conveyer. The line is attended by four workers. The manufacturing process is completely automatic. Finished products are put out every 20 seconds. The entire cycle for manufacturing a wheel lasts approximately 40 minutes, which is 20 times as fast as in any other technology used.

The first automatic line is slated for the Moscow Grinding Products Plant.

Scientists at the institute are now working on designs of new automatic lines for the production of harder abrasive wheels.

BEGIN SERIES PRODUCTION OF AUTOMATIC FOR GRINDING CRUSHING-ROLLERS -- Moscow, Moskovskiy Komsomolets, 3 Oct 51

In crushing abrasive material or rock, even the hardest rollers of crushing machines become covered with dents and scratches.

Scientific associates of the All-Union Scientific Research Institute of Abrasives and Grinding, in cooperation with innovators of the institute's experimental plant, have developed an automatic device for grinding the surface of worn-out rollers. The automatic is installed in the crushing machine, making it possible to grind the rollers without removing them from the aggregate. This increases the productivity of the crushing machine by more than 50 percent.

The first model of the grinding automatic has been successfully tested at the Ural'skiy Shlifzerno Plant. Series production of the automatics has been started at the experimental plant.

GIVE SUGGESTIONS FOR BETTER UTILIZATION OF ELECTRIC SPARK TECHNIQUES -- Leningradskaya Pravda, 14 Oct 51

Many important problems have been solved at the Leningrad Carburetor Plant imeni Kuybyshev by adopting electric spark technology. For example, 420 holes 0.2-0.5 millimeter in diameter can be made in pobedit dies in seven machine-tool shifts. With the usual method, this would take up to 200 machine-tool shifts.

Although the virtues of electric spark processing are many, its field of application must be broadened considerably. First, large series production of industrial units must be set up. Personnel qualified in this field are now available.

Electric spark units are developed and manufactured at individual enterprises for their own use, a practice which is sometimes carried out haphazardly and leads to nonproductive expenditures.

In spite of considerable experience in this field, it has been poorly disseminated in Leningrad and its outskirts. Frequently, workers of various plants from other cities who have visited the Carburetor Plant have told about their difficulties in introducing electric spark processing at their enterprises. The shortage of printed material, books, pamphlets, etc., is preventing the adoption of this advanced method.

MUST PROPAGANDIZE ELECTRIC SPARK TECHNIQUES -- Leningradskaya Pravda, 18 Dec 51

In recent years, new technologies in the field of electrical processing have been developed, tested, and found effective and economical. However, their application in industry has been limited. The principal reason for this appears to be the completely inadequate propagandization of newly acquired techniques. A great deal more material on this subject should be printed.

Recommended lists of literature which have been published are not of very good quality. The innovator is not served well if the recommended literature is obsolete or erroneous. For example, the bibliography "Electrical Methods of Metalworking" includes an article by Zolotykh on an obsolete method of high-voltage spark grinding, a book by Baranov recommending the use of gasoline in spark processing, and many other references of questionable value, the authors of which are associates of the Palace of Scientific and Technical Propaganda. On the other hand, not one of the books on electrical polishing, or electromechanical cutting, works of the All-Union Conference on High-Speed Metalworking, or other data needed by innovators has been recommended.

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